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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/720,761	03/26/2001	Franz Laermer	10191/1629	5642

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EXAMINER

CHEN, KIN CHAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. <u>09/720,761</u>	Applicant(s) LAERMER ET AL.	
	Examiner Kin-Chan Chen	Art Unit 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19,21-24,27-36 and 38-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19,21-24,27-36 and 38-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The examiner notes that the previously presented claims in the current amendment (June 3, 2005, pages 2-5) have numerous editorial (typographic) errors. Applicant is required to review and correct them in accordance with **the previously presented claims**.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 19, 21, 22, 24, 27, 34-36, 39, and 40 are rejected under 35 U.S.C. 103(a) as obvious over Flamm et al (Journal of the Electrochemical Society, Dec. 1982, USA Bd 129, Nr.12, Page 2755-2760) in view of Kawasaki et al (US 4,795,529) as evidenced by Pu et al. (US 5,843,847).

Flamm teaches a method of anisotropic plasma etching a laterally defined structure in a silicon substrate using a process gas. Flamm teaches adding a fluorine-delivering etching gas to the process gas. The fluorine-delivering etching gas may include NF_3 , ClF_3 or BrF_3 (page 2756, col. 1, full paragraph 3). Flamm also teaches that plasma in a wide range of gas mixtures including CF_4 , CF_4/O_2 and $\text{C}_2\text{F}_6/\text{O}_2$ can be used to supply fluorine atoms for selective isotropic silicon etching. The said gas

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mixtures can deposit polymer (so-called precipitating at least one passivating material in the instant claims), see page 2755, col. 1 and 2). Because it is known that gas comprising C_2F_6 can supply fluorine atoms for selective isotropic silicon etching and deposit polymer and because it is disclosed by Flamm, hence, it would have been obvious to one with ordinary skill in the art to incorporate gas mixtures including CF_4/O_2 and C_2F_6/O_2 in the method of etching silicon using the fluorine-delivering etching gas including NF_3 , ClF_3 or BrF_3 (instant claims 19, 24, 25) and use them in any combinations thereof in order to provide their art recognized advantages and produce an expected result since they have been taught to be useful for the same purpose (etching silicon substrate), see case law cited below. Also see Pu et al. (US 5,843,847; col. 1, line 62 through col. 2, line 4) in the record as evidence for the "known" statement of depositing polymer as a passivating layer. Furthermore, Flamm teaches using C_2F_6 in anisotropic etching of silicon as stated above, because same material is used in the same process as claimed, therefore it would inherently contain same property such as a passivating material. The claimed invention differs from Flamm by using C_4F_8 . In the method of plasma etching apparatus and method, Kawasaki teaches that C_4F_8 may be used as etchant. Kawasaki also teaches that **2MHz** may be used (col. 9, lines 20-21; col. 13, lines 50-51; col. 21, lines 18-21). Hence, it would have been obvious to one with ordinary skill in the art to use C_4F_8 as etchant with **2MHz** in the process of Flamm because each of which is taught to be useful to etch same kind of material.

" It is prima facie obvious to use two compositions (two methods) each of which is taught by the prior art to be useful for the same purpose. " In re Kerkhoven 205 USPQ

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1069 (CCPA 1980). In re Susi 169 USPQ 423, 426 (CCPA 1971). See also Ex parte Quadranti 25 USPQ 2d 1071 (BPAI 1992).

4. Claims 19, 21, 22, 24, 27, 34-36 and 38-40 are rejected under under 35

U.S.C. 103(a) as obvious over Sony (EP 0 414 372 A2) in view of Kawasaki et al (US 4,795,529) as evidenced by Pu et al. (US 5,843,847).

Sony teaches a method of anisotropic plasma etching a defined structure in as silicon substrate using a process gas. Sony teaches adding a fluorine-delivering etching gas to the process gas. The fluorine-delivering etching gas may include ClF_3 . Sony also teaches that plasma in a wide range of gas mixtures including SiF_4 , Cl_2/O_2 , and Cl_2/N_2 can be used to supply fluorine atoms for selective isotropic silicon etching. The said gas mixtures can deposit protective layer (so-called precipitating at least one passivating material in the instant claims), (col.1 (page 2), lines 41-48; Col. 4 (page 3), lines 7-17). Sony teaches using dry etching to from a desired configuration in the silicon substrate. Sony is not particular about the desired configuration. Hence, it would have been obvious to one with ordinary skilled in the art to etch a laterally defined structure because it is one of the most popular structure in the semiconductor device fabrication. The claimed invention differs from Sony by using C_4F_8 . In the method of plasma etching apparatus and method, Kawasaki teaches that C_4F_8 may be used as etchant. Kawasaki also teaches that **2MHz** may be used (col. 9, lines 20-21; col. 13, lines 50-51; col. 21, lines 18-21). Hence, it would have been obvious to one with ordinary skill in the art to use C_4F_8 as etchant with **2MHz** in the process of Sony because each of which is taught

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to be useful to etch same kind of material. Also see Pu et al. (US 5,843,847; col. 1, line 62 through col. 2, line 4) in the record as evidence for the "known" statement of depositing polymer as a passivating layer.

" It is prima facie obvious to use two compositions (two methods) each of which is taught by the prior art to be useful for the same purpose. " In re Kerkhoven 205 USPQ 1069 (CCPA 1980). In re Susi 169 USPQ 423, 426 (CCPA 1971). See also Ex parte Quadranti 25 USPQ 2d 1071 (BPAI 1992).

As to claim 38, since Sony teaches using SiF_4 and O_2 , forming passivating material including SiO_2 would have been expected because same etchants are used for etching same material. Furthermore, it is well known that during the silicon etching, the passivating layer of SiO_2 may be formed when the etchant comprises oxygen, see Meyer (US 5,182,234; col. 8, lines 16-18) as evidence.

5. Claims 23, 28, and 29-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flamm or Sony in view of Kawasaki et al as evidenced by Pu et al as applied to claims 19 and 24 above, and further in view of Meyer (US 5,182,234).

Unlike the claimed invention, the combined prior art (Flamm or Sony, Kawasaki, Pu) does not disclose that helium may be used in the process of etching silicon substrate. In the method of etching silicon substrate, Meyer teaches that helium may be used in the process of etching silicon substrate (col. 2, lines 65-68). Hence, it would have been obvious to one with ordinary skill in the art to incorporate helium as taught by Meyer in the process of the combined prior art in order to ensure the stability and promotes uniformity of the etching.

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The above-cited claims specify the properties and effect of the light, ionized gas (e.g., improve selectivity, reduce charging effects, increase separation....). However, the same materials are used with the same process. It appears that the method of the prior art would contain the same properties and functions as instantly claimed.

The discovery of a new property of a previously known composition, even if unobvious from the prior art, cannot impart patentability to such a composition. See In re Spada, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990).

Once a reference teaching product (composition) appearing to be substantially identical is made the basis of a rejection, and the examiner presents evidence of reasoning to show inherency, the burden shifts to the applicant to show an unobvious difference. Whether the rejection is based on "inherency" under 35 U.S.C. §102, or on "prima facie obviousness" under 35 U.S.C. §103, jointly or alternatively.

In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980). See also In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34(CCPA 1977).

Response to Arguments

6. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pu et al. (US 5,843,847; col. 1, line 62 through col. 2, line 4) teaches that fluorocarbon gas forms polymeric by products that deposits as a passivating layer.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (703) 305-0222. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (703) 305-2667. The fax phone number

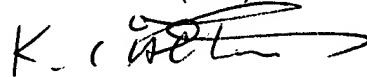
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for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is (703) 308-2934.

July 8, 2005



Kin-Chan Chen
Primary Examiner
Art Unit 1765